

The landmark Americans with Disabilities Act (ADA), enacted on July 26, 1990, provides comprehensive civil rights protections to individuals with disabilities in the areas of employment (title I), State and local government services (title II), public accommodations and commercial facilities (title III), and telecommunications (title IV). Both the Department of Justice and the Department of Transportation, in adopting standards for new construction and alterations of places of public accommodation and commercial facilities covered by title III and public transportation facilities covered by title II of the ADA, have issued implementing rules that incorporate the **Americans with Disabilities Act Accessibility Guidelines (ADAAG)**, developed by the Access Board.

U. S. Architectural and Transportation Barriers Compliance Board

PUBLIC LAW 101-336 Americans with Disabilities Act

"Title III applies to private entities that are considered public accommodations because they affect interstate commerce (**42 USC § 12131-12165**). The entities listed include places of entertainment or exhibition (motion picture house; a theater; a concert hall; a stadium; or other place of exhibition or entertainment) (**42 USC § 12181(7)(C)**)."

The Congressional Conference Report, giving background to legislative deliberations behind the ADA, states the following:

"Open-captioning, for example, of feature films playing in movie theatres, is not required by this legislation. Filmmakers are, however, encouraged to produce and distribute open-captioned versions of films and theaters are encouraged to have at least some pre-announced screenings of a captioned version of feature films." -- **Report 101-116, August 30, 1989, page 64.**

Bulletin #8: Theatrical Movie Captioning Systems

How are movies presently made accessible to people who are deaf or hard-of-hearing?

Theatrical movies are presently made available in a very limited fashion through the use of open or closed (hidden or discreet) captions. Some US theaters hold special screenings of films with open captions (subtitles that are permanently placed on the film and cannot be turned off) based on specific demand. This option is limited by the fact that most theatrical releases of first-run films are not made available with open captions by movie studios and by the fact that most exhibitors believe their general audiences would be distracted by visible text on the screen. However, because most non-English-language foreign films contain English subtitles, those films are equally accessible to all audiences.

How many people who are deaf or hard-of-hearing can benefit from captioned movies?

According to the National Institute on Deafness and Other Communication Disorders of the National Institutes of Health, there are more than 28 million Americans who have some degree of hearing loss. Captioning makes films accessible to those people whose hearing is too limited to benefit from assistive listening devices (ALDs) -- a group that makes up a significant percentage of the 28 million.

"Movie theaters are not required to present open-captioned films.

However, other public accommodations that impart verbal information through soundtracks on films, video tapes, or slide shows are required to make such information accessible to persons with hearing impairments. Captioning is one means to make the information accessible to individuals with disabilities. **(Appendix B to 28 CFR §36.303).**"

"A public accommodation shall take those steps that may be necessary to ensure that no individual with a disability is excluded, denied services, segregated or otherwise treated differently than other individuals because of the absence of auxiliary aids and services, unless the public accommodation can demonstrate that taking those steps would fundamentally alter the nature of the goods, services...being offered or would result in an undue burden, i.e., significant difficulty or expense." (b) The term "auxiliary aids and services" includes "qualified interpreters, note-takers, computer-aided transcription services, written materials, telephone handset amplifiers, assistive listening devices, assistive listening systems, telephones compatible with hearing aids, closed caption decoders, open and closed captioning, telecommunications devices for deaf persons (TDDs), videotext displays, or other effective methods of making aurally delivered materials available to individuals with hearing impairments." (c) "A public accommodation shall furnish appropriate auxiliary aids and services where necessary to ensure effective communications with individuals with disabilities." **(28 CFR §36.303 - Auxiliary aids and services)**

What design principles are used for the inclusion of hidden or discreet captioning systems in movie theaters?

The following principles apply to the design of hidden or discreet captioning systems in theaters:

- the system should be flexible and easy to use by patrons who are deaf or hard-of-hearing of different heights, physical capabilities and ages;
- the system should operate effectively from as many seats in the auditorium as possible;
- the system should be very durable so as to withstand use by many people over a long period of time and so that only minimal maintenance is required for effective usage;
- the system's user interface (the technology at the individual seat) should not require wiring for power or signal reception;
- the system should neither obstruct nor distract other patrons in the theater when in use by a person who is deaf or hard-of-hearing;
- the system should not be vulnerable to theft;
- the system should be inexpensive to purchase and maintain so as not to require a significant financial commitment by the facility owner.

What does the ADA and its regulations say about making movies accessible in theaters?

The Americans with Disabilities Act contains the following information about the accessibility of movies in theaters:

1. "Title III applies to private entities that are considered public accommodations because they affect interstate commerce (42 USC § 12131-12165). The entities listed include places of entertainment or exhibition (motion picture house; a theater; a concert hall; a stadium; or other place of exhibition or entertainment) (42 USC § 12181(7)(C))."
2. The Congressional Conference Report, giving background to legislative deliberations behind the ADA, states the following:

"Open-captioning, for example, of feature films playing in movie theatres, is not required by this legislation. Filmmakers are, however, encouraged to produce and distribute open-captioned versions of films and theaters are encouraged to have at least some pre-announced screenings of a captioned version of feature films." -- Report 101-116, August 30, 1989, page 64.

When the ADA was signed into law in 1990, there were no systems available for providing closed captions in theaters; only open-captioning of theatrical films had been in use at that time.

3. "Movie theaters are not required to present open-captioned films. However, other public accommodations that impart verbal information through soundtracks on films, video tapes, or slide shows are required to make such information accessible to persons with hearing impairments. Captioning is one means to make the information accessible to individuals with disabilities. (Appendix B to 28 CFR §36.303)."
4. "A public accommodation shall take those steps that may be necessary to ensure that no individual with a disability is excluded, denied services, segregated or otherwise treated differently than other individuals because of the absence of auxiliary aids and services, unless the public accommodation can demonstrate that taking those steps would fundamentally alter the nature of the goods, services...being offered or would result in an undue burden, i.e., significant difficulty or expense." (b) The term "auxiliary aids and services" includes "qualified interpreters, note-takers, computer-aided transcription services, written materials, telephone handset amplifiers, assistive listening devices, assistive listening systems, telephones compatible with hearing aids, closed caption decoders, open and closed captioning, telecommunications devices for deaf persons (TDDs), videotext displays, or other effective methods of making aurally delivered materials available to individuals with hearing impairments." (c) "A public accommodation shall furnish appropriate auxiliary aids and services where necessary to ensure effective communications with individuals with disabilities." (28 CFR §36.303 - Auxiliary aids and services)

Why should captions be provided?

Captions should be provided to give today's 28 million Americans who are deaf or hard-of-hearing equal access to the first-run movies that many millions of hearing people are able to enjoy. As the percentage of the population that is deaf or hard-of-hearing steadily increases -- based on the growing number of older people (aged 65 or older) and the longer life expectancy of adults -- the need for captions will become more urgent. Currently, members of this large, ever-increasing under-served population depend on closed-captioned television and video for their audio-visual

entertainment, which significantly limits their ability to participate in the social, recreational and educational aspects of movie-going. Assistive listening devices, presently made available under ADA regulations, do not serve the significant portion of the population who rely on visual translations of sounds due to more severe hearing losses.

What solutions exist for providing closed captions in movie theaters?

A number of technological developments over the past decade have made the provision of discreet, or hidden, captions in movie theaters possible (these systems are described in detail below). One system presently in distribution is the "Rear Window Captioning" system. Another called the "Bounce Back Mirror Image Captioning System" is being marketed and, like the Rear Window System, uses the concept of reflecting captions from a reverse-text display at the rear of a theater. These systems differ in how the caption displays are synchronized and the hardware required, as well as how the caption production is paid for.

In addition, experiments have been performed with glasses that include a small monitor that displays captions. Though an interface for movie theaters hasn't yet been developed, this system, called "Personal Captioning Glasses," is being marketed for classroom and lecture hall use.

Seat-back displays have been employed in a number of non-conventional settings such as planetariums and opera houses. These systems employ a vacuum fluorescent display (VFD) which is mounted on the seat in front of the patron. Though others in the audience can see the captions, distractions have been minimized through the use of filters.

What is the Rear Window Captioning system?

The patented Rear Window system is a technology that makes it possible for exhibitors to provide closed captions for those who need or desire them without displaying the captions to the entire audience and without the need for special prints or separate screenings. Developed in the early 1990s with the assistance of grants from the National Institute on Disability and Rehabilitation Research (NIDRR), the system was first deployed at the National Air & Space Museum's IMAX® theater in December of 1994.

How does it work?

The Rear Window Captioning system (Figure 1) displays reversed captions on a light-emitting diode (LED) text

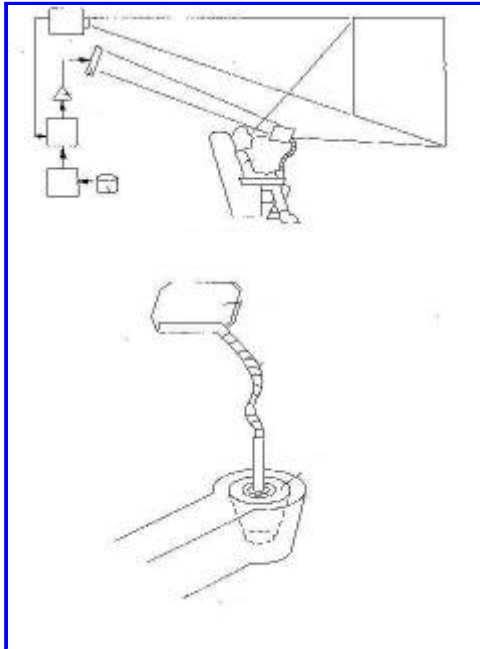


Figure 1: Rear Window Captioning System

display, which is mounted in the rear of a theater. Patrons use transparent acrylic panels attached to their seats (either with a flowerpot-shaped base designed to fit into a drink holder on most theater seats or with a clamp that attaches to the armrest) or on freestanding floor stands (like a microphone stand). The acrylic panels reflect the captions so that they appear superimposed on or beneath the movie screen. The reflective panels are portable and adjustable, enabling the user to sit anywhere in the theater and to either superimpose the captions over the film image or position the captions above or below the movie screen, depending on preference.

How do Rear Window captions differ from open captions?

Open captions are similar to subtitles. They are "burned" onto the film and are visible to everyone in the theater. To provide open captions, it is necessary for studios to create, and for exhibitors to obtain, a special print of the film. Open-captioned films are generally presented at special screenings.

The Rear Window system is a way of providing closed captions. The captions are not on the film itself, so there is no need for a special print. The captions are on a floppy disk or CD that plays in synchronization with the film and can be made visible -- via a reflector -- to only those patrons who choose to see them. The captions are available during each regularly scheduled presentation for as long as the film plays in the equipped theater (not all films are presently closed-captioned).

How are the captions synchronized to the film?

The synchronization process differs depending on whether the system is being used in a conventional movie theater or specialty theater (e.g., IMAX® or other large-format theaters or theme parks' theatrical attractions). In conventional movie theaters, captions are transmitted to the LED panel by the Digital Theater Systems (DTS) digital audio system, which provides multi-channel digital audio on CD-ROMs. The caption data resides on an additional CD-ROM that plays in synchronization with the digital audio disks in a DTS player (model DTS 6D, with additional models soon to be available). A "reader head" (a sensing device) attached to the film projector reads a timecode track printed on the film and signals the DTS player to play the audio and captions in synchronization with the film. In turn, the DTS player sends the captions to the LED display. In specialty theaters, caption data is fed to the LED panel by a

computer with special software that synchronizes the caption files to the film.

What types of facilities would want to install this system?

Theaters and auditoriums where conventional format or large format (such as IMAX®) theatrical films are shown would want to install the Rear Window Captioning system. These facilities may include conventional, public movie theaters, private movie theaters (e.g., on a college or university campus), large format theaters (found at museums, theme parks or, more frequently, at mainstream multiplexes) and at any other facility where film with a soundtrack is used to provide entertainment or education.

What specialized equipment is needed to provide Rear Window captions?

In order to provide Rear Window captions, the theater must purchase and mount -- in the rear of the theater -- a light-emitting diode (LED) text panel or "datawall," which displays reverse captions. This component must be 32 characters wide and 3 rows tall. The characters, or letters, that make up each row are 3.2 inches or 4.1 inches tall depending on the size of the auditorium and the distance people will be sitting from the datawall. A theater also must purchase either portable seat-mounted or freestanding reflectors on which patrons who are deaf or hard-of-hearing can read the reverse text from the LED panel. The reflector component consists of a 3/16-inch thick transparent or semi-transparent acrylic panel, which is approximately 4 inches tall by 12 inches wide, attached to a flexible, 12 to 18-inch-long gooseneck arm.

How much does it cost a theater to install Rear Window?

The cost of installing the Rear Window Captioning system varies from theater to theater based on factors such as theater size and existing equipment. The number and style of reflectors that a theater chooses to purchase also will affect the overall cost. The basic cost of the LED datawall is estimated at approximately \$4,000 for conventional theaters and \$8,000 for large specialty theaters (IMAX®). The cost per reflector is approximately \$80; theaters that have installed the system have initially purchased 12 reflectors at \$50 apiece. The DTS 6D player, which many theaters already have available, costs \$6,000 if purchased separately. Installation costs depend on the theater's maintenance arrangements; arrangements for installation can be made with the equipment supplier.

Will installation require any alteration to existing facilities? If so, what types of alterations need to be made?

In order to provide Rear Window captions, the facility will need to acquire and mount a light-emitting diode (LED) display mechanism to the wall in the rear of the theater. Mounting hardware is required, which is able to support a 30- to 50-pound datawall, that is 3- to 5-feet-long and 1.5- to 2-feet-high. The LED display requires standard electrical service and a data signal fed to it from the projection booth. The reflectors may be mounted to theater seats via existing or added drink holders. Theaters without drink holders can purchase reflectors fitted with a clamp or mounted on freestanding microphone stands. Some theaters have fitted seats with a mounting bracket that enables the bottom of the gooseneck arm to be fitted directly into an area between each seat.

Will additional electrical service be needed to accommodate Rear Window?

The LED display requires a standard electrical outlet.

How many equipped seats or equipment attachments need to be available?

It is recommended that theaters purchase a number of reflectors equal to approximately 4% of a theater's seating capacity.

Are special seats necessary?

The installation of special theater seats is not required for use of Rear Window captions. The seat-mounted reflectors can be fitted to standard theater seats using the drink holder or armrest, while freestanding reflectors can be used in theaters without drink holders.

Are both fixed and portable reflectors available to accommodate different types of seating? Or is there a standard design that works with any kind of seat?

The reflectors are presently available in three styles. The portable, seat-mounted model consists of a movable, acrylic screen on an adjustable gooseneck arm that can be fitted to any theater seat that has a built-in drink holder. The clamp model can be used to attach the gooseneck to the armrest of seats without drink holders. The freestanding device is mounted on a floor stand (similar to a microphone stand), which can be placed adjacent to any type of theater seat, but is most effective when used on a level floor. To

accommodate patrons who are deaf or hard-of-hearing and use wheelchairs, theaters may opt to order several clamp or freestanding reflectors.

Are the reflectors easy to use, attach and adjust?

The screens are portable and simple to use; the seat-mounted reflector is easily mounted in the drink holder or on the seat arm, while the freestanding reflector is placed beside the viewer's seat. In any case, the gooseneck arm and tilting acrylic panel can be adjusted until the captions are visible and comfortable to watch. Test captions are generally made available before the film begins to enable Rear Window users to adjust their reflectors. Depending on the user's preference, captions can be positioned over or just below the movie screen. Some users have reported that reflectors work best when positioned low and further away from the body, allowing the user to move in the seat with only minimal reflector adjustments.

Are the reflectors adjustable for both child and adult users?

The reflective screens can be adjusted for use by both children and adults. There is no height restriction, though children or very short adults may require assistance in bending the reflector arm into place.

Do users need to sit in certain seats in order to use the Rear Window?

The Rear Window system is designed so that the captions are visible from any seat in the theater. However, depending on the size and layout of the theater and the location of the caption display, some seats may offer better viewing angles than others may. Seats in the middle of the theater generally offer the best view of Rear Window captions. Some LED displays have been mounted above an auditorium's balcony, thereby making the seats directly underneath the balcony unusable with a reflector.

Can another patron's head block the user's view of the captions?

Because the captions are displayed in the rear of the theater, someone sitting in front of the user cannot block them. The LED display can be hung high enough so that the heads of tall people behind the user will not block the view of the captions. However, if someone behind the user stands up, they may temporarily block the captions -- just as someone who stands up in front of a viewer may temporarily block the picture.

Can the reflectors block the view of, or be distracting to, other patrons?

As the clear acrylic reflector is adjusted for use by individual patrons, and only those patrons can see the reflection, the use of the Rear Window system will not affect other patrons' views of the movie screen in any way.

Do the reflectors block the user's view of the screen in any way?

Since the reflector is made of clear acrylic, the user can see through the reflective panel to the screen, or can adjust the reflector so the captions appear below the screen. If the reflector is not adjusted properly, a user's head may block his or her own view of the captions. In this case, the user will need to move the reflector slightly to one side or tilt the plastic panel until their view is complete.

How do users know when Rear Window is available in a theater?

Theaters that have made the Rear Window Captioning system available to their patrons have publicized the service to build awareness in their community. Publicity generally includes posting appropriate signage at ticket booths, including information in theater advertising. When the service is offered initially, theaters often publicize the system's availability via announcements to local newspapers and to local organizations and schools that serve deaf and hard-of-hearing people.

Is there an additional cost to moviegoers to use Rear Window?

Moviegoers who request use of the Rear Window Captioning equipment pay the regular adult, child or senior ticket prices, with no additional costs.

Is there a similar system to accommodate blind and low-vision audiences?

There is a discreet or hidden system -- called DVS Theatrical® -- that delivers narrated descriptions of key visual elements via wireless headphones to blind and visually impaired patrons.

Where can theater owners and designers get more information on Rear Window?

For more information on the Rear Window Captioning system and DVS Theatrical, contact:

The Media Access Group at WGBH
300 E. Magnolia Boulevard
2nd Floor
Burbank, California 91502
(818) 562-3344 (voice)
(818) 562-1919 (TTY)
(818) 562-3388 (fax)
access@wgbh.org (e-mail)
www.MoPix.org

or

The Media Access Group at WGBH
125 Western Avenue
Boston, Massachusetts 02134
(617) 300-3400 (voice)
(617) 300-2489 (TTY)
(617) 300-1035 (fax)
access@wgbh.org (e-mail)
www.MoPix.org

Who manufactures the Rear Window equipment?

The reflectors and complete Rear Window and DVS Theatrical system packages are provided by:

Boston Light & Sound
290 N. Beacon Street
Brighton, Massachusetts 02135-1990
(617) 787-3131
www.blsi.com

The light-emitting diode (LED) panel, or datawall, is manufactured by:

Sunrise Systems, Inc.
720 Washington Street
Pembroke, Massachusetts 02359
(781) 826-9706

and

TransLux Corporation
110 Richards Avenue
Norwalk, Connecticut 06854
(800) 243-5544

Other theatrical movie captioning systems

"Bounce Back" system

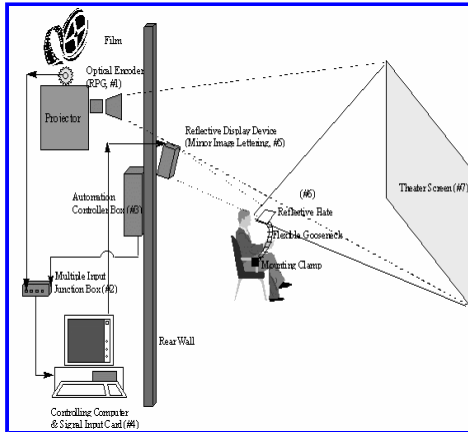


Figure 2: Bounce Back Mirror Image Captioning System

Developed by Cinematic Captioning Systems, Inc. of Indianapolis, the Bounce Back (Figure 2) Mirror Image Captioning System (MICS) is similar to the Rear Window system in that an LED panel at the rear on the theater displays synchronized captions in reverse. These captions are made visible to moviegoers who choose to use a seat-mounted reflector, which catches the reflection of the caption image for individual viewing.

Bounce Back differs from the Rear Window system in that the system used to synchronize the captions utilizes a stand alone personal computer. Cinematic Captioning Systems also charges the theater, rather than the movie studio, for the rights to use the captions they produce. The user experience is similar to that of the Rear Window system.

For information, contact: Cinematic Captioning Systems, Inc.

8111 Bel Moore Boulevard
Indianapolis, Indiana 46259
(317) 862-3418 or (317) 414-5682
www.moviecaptions.com



Figure 3: Personal Captioning Glasses

Personal Captioning glasses

This is a clip-on captioning display (Figure 3) that attaches to the frame of glasses. Captions are provided to the device through wireless transmission. An interface with movie projection systems has not been developed yet.

For information, contact:
Personal Captioning Systems
9401 North Nashville
Morton Grove, Illinois 60053
(847) 965-6544 (voice/TTY)
www.personalcaptioning.com



Figure 4: Seat-back display

Seat-back display

The vacuum fluorescent display (VFD) seat-back device is a small, personal text display, which can be mounted on the back of the seat in front of the user. Captions appear on a small height-adjustable screen, which must be wired for power and data input at each seat. The most extensive installations of this technology are at the Santa Fe Opera and New York City's Metropolitan Opera House and is used for providing translations of an opera's libretto (it is called the "Electronic Libretto System"). A similar system has been installed at the Hayden Planetarium at Boston's Museum of Science.

For information, contact:

Figaro Systems, Inc. (Metropolitan Opera and Santa Fe Opera installations)
536 Old Santa Fe Trail
Santa Fe, New Mexico 87501
(505) 471-8364

Design Continuum, Inc. (Hayden Planetarium installation)
1220 Washington Street
West Newton, Massachusetts 02165
(617) 969-5400

DTS-CSS Cinema Subtitling System

This is a subtitling and captioning system for the motion picture industry that projects captions and subtitles directly onto the movie screen instead of etching or over-laying them onto the film itself. A single inventory of film prints can be used along with an appropriate DTS disc to provide captioning or subtitling information, or the chosen foreign language audio track, for projection onto the screen. In addition to providing access for moviegoers who are deaf or hard-of-hearing through captions, the DTS audio discs hold up to 40 different languages for additional subtitling capability.

For information, contact:

Digital Theater Systems, Inc.
5171 Clareton Drive
Agoura Hills, California 91301
(818) 706-3525
www.dtsonline.com

What about open-captioned films?

The major distributor of open-captioned films in the United States is TRIPOD Captioned Films (TCF), a non-profit, community outreach project of the TRIPOD Model School Program in Burbank, California. It provides open-captioned (subtitled in English) film prints for specially scheduled showings at certain movie theaters around the country.

For information, contact:
TRIPOD Captioned Films
1727 West Burbank Boulevard
Burbank, California 91506-1312
(818) 972-2080 (voice/TTY)
(818) 972-2090 (fax)
info@tripod.org (e-mail)
www.tripod.org

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